MONTHLY WEATHER REVIEW,

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(General Weather Service of the United States.)

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

In preparing this REVIEW the following data, received up to August 20th, have been used, viz: the regular tri-daily weather charts, containing the data of simultaneous observations taken at 133 Signal Service stations and 15 Canadian stations, as telegraphed to this office; 151 monthly journals and 174 monthly means from the former, and 15 monthly means from the latter; 213 monthly registers from Voluntary Observers; 54 monthly registers from United States Army Post Surgeons; Marine Records: International Simultaneous Observations; monthly reports from the local Weather Services of Iowa, Nebraska and Missouri, and of the Central Pacific Railway Co.; reliable newspaper extracts; special reports.

BAROMETRIC PRESSURE.

The distribution of mean atmospheric pressure over the United States and Canada for the month of July, 1881, is shown by isobaric lines (in black) upon chart No. II. The area of lowest pressure covers the Canadian Maritime Provinces, and the areas of high the Gulf states, Tennessee, the Upper Mississippi and Lower Missouri valleys, and the Northern Pacific coast region. Within the same parallels the pressure is quite evenly distributed over the country east of the 100th meridian. Compared with the preceding month, the pressure is generally higher over the entire country, the increase ranging from 0.01 to 0.13 inch. The regions of greatest change are found in the states bordering the Mississippi river and along the Northern Pacific coast.

Departures from the Normal Values for the Month.—Compared with the means for previous years, the mean pressure of the present month is below the average at all stations east of the boundary formed by the junction of the Mississippi and Ohio rivers, the western line of Pennsylvania and the eastern shores of Lakes Erie and Ontario, and the St. Lawrence river. Westward of this boundary to, and including the Pacific coast regions, the pressure is generally above the mean. Within no district over the country do the departures indicate an unusual variation from the mean, the general range being from normal to 0.10 inch, the latter reported from only two stations, New London and Wilmington, and normal from Galveston, Brownsville, Tex., Punta Rassa, Denison, Tex., Louisville and Denver. The regions of greatest departure, are the Atlantic coast states from Jacksonville to Eastport, the Upper Lake region, Minnesota and California, showing a variation of from 0.04 to 0.10 inch. The regions of least departure are the Gulf coast, Tennessee and the Ohio valley, ranging from normal to 0.02 inch.

Barometric Ranges.—The range of pressure for the month has in general varied from 0.4 to 0.6 inch, and in the extremes from 0.16 inch at Ft. Davis, Tex., to 0.97 inch at Eastport. Throughout the several districts the monthly barometric range varied as follows: New England, 0.74 inch at New Haven to 0.97 inch at Eastport; Middle Atlantic states, 0.52 at Delaware Breakwater to 0.76 at Albany; South Atlantic states, 0.39 at Jacksonville to 0.59 at Macon and Kittyhawk; Eastern Gulf states, 0.26 at Key West to 0.36 at Pensacola; Western Gulf states, 0.25 at Indianola and Galveston, to 0.43 at Ft. Gibson; Rio Grande valley, 0.25 at Eagle Pass, to 0.30 at Brackettville; Ohio valley and Tennessee, 0.35 at Memphis to 0.67 at Columbus; Lower Lake region, 0.50 at Cleveland to 0.67 at Oswego; Upper Lake region, 0.54 at Port Huron to 0.68 at Marquette; Upper Mississippi valley, 0.42 at Cairo, to 0.66 at Des Moines; Missouri valley, 0.58 at Leavenworth, to 0.72 at Ft. Bennett; extreme Northwest, 0.62 at Ft. Buford, to 0.78 at St. Vincent; Northern Slope, 0.44 at Cheyenne, to 0.61 at Ft. Keogh; Middle Slope, 0.35 at Ft. Elliott, to 0.56 at Dodge City; Southern Slope, 0.16 at Ft. Davis, to 0.41 at Ft. Griffin; Northern Plateau, 0.54 at Eagle Rock, to 0.73 at Lewiston; Middle Plateau, 0.41 at Pioche, to 0.54 at Salt Lake City; Southern Plateau, 0.19 at Silver City, to 0.43 at Phœnix; North Pacific coast, 0.49 at Roseburg, to 0.52 at Portland; Middle Pacific coast, 0.37 at San Francisco, to 0.52 at Red Bluff; South Pacific coast, 0.24 at San Diego, to 0.42 at Yuma.

Areas of High Barometer.—Four such areas have been sufficiently important during the month of July, 1881, to merit description.

No. I.—This area, which was partly described in the June REVIEW as high area No. VI, was present in the Upper Lake region on the morning of the 1st as an area of 30.2. Northerly winds prevailed in the Lake region, New England and the Middle Atlantic states, with clear weather, and southerly winds and threatening weather in the South Atlantic states. By the afternoon reports, the winds in the South Atlantic states had shifted to northeasterly, and heavy rains were reported from that district and the East Gulf states, and local rains from the Ohio valley and Tennessee. The temperature fell during the 1st from 4° to 12° at stations in the South Atlantic and Gulf states, and rose slightly in the Lower Lake region. The area moved slowly southeastward during the 1st and 2d, and on the morning of the 3d was central in Tennessee. During the 2d the winds in the Lake region, New England and the Middle Atlantic states backed to southwesterly, and the temperature rose decidedly in all but the latter district, in which it remained nearly stationary. The weather cleared in the South Atlantic and Gulf states, and on the morning of the 3d fair weather prevailed in all districts east of the Mississippi river and in the Northwest. During the 3d the area remained nearly stationary, the pressure increasing slightly in the Gulf states and decreasing slowly, with rising temperature, in the Northwest, and thence eastward to the Atlantic coast. During the 4th the high barometer moved slowly southward, and during the 5th and 6th was central as an area of 30.1 in the Gulf states; after the latter date it ceased to have any marked influence on the weather conditions. The minimum temperatures for the month were caused by this area at many of the stations in the Lake region, the Ohio valley and Tennessee on the 1st and 2d; in the Middle Atlantic states on the 2d and 3d, and in the South Atlantic states on the 3d and 4th. Cautionary signals were displayed on the Atlantic coast from Cape Henry, Va., to Macon, N. C., on the morning of the 1st in anticipation of northeasterly winds. They were lowered at midnight of the 2d, having been partly justified by the following maximum velocities: Cape Henry, NE. 25 miles; Kittyhawk, NE. 34; Cape Hatteras, NE. 28, and Macon, N. 28.

No. II.—On the morning of the 8th low area No. II was central in Manitoba, and the pressures in the Northwest were below the mean—Omaha barometer 0.25 inch below the normal. During the 8th and 9th the pressures rose rapidly in the extreme Northwest and in the Lower Missouri and Upper Mississippi valleys in rear of the depression which moved eastward north of the latter district. The high area moved slowly eastward across the lakes during the 9th and 10th, causing local rains in the Lake region on the 10th and 11th, and in New England on the latter date. The minimum temperatures for the month at stations in the Upper Missouri valley occurred on the 8th and 9th.

No. III.—During the night of the 20th and morning of the 21st the barometer rose rapidly in all districts west of the Mississippi river, and on the afternoon of the latter date an area of high barometer made its appearance in Montana, Fort Shaw barometer 0.27 inch and Fort, Buford barometer 0.26 inch above the mean. Low area No. V was then central in the Upper Mississippi valley near LaCrosse. The pressures west of the Mississippi continued to increase slowly until the 24th, the high barometer remaining nearly stationary. On the 25th and 26th the barometer fell slowly on the Pacific coast but rose slightly in the Northwest, and at the afternoon report of the latter date the high area was central in the Upper Mississippi valley, in which district and in the Lake region the pressures gradually increased until the 29th, when the barometer was above the normal in all districts east of the Mississippi river, excepting the South Atlantic and East Gulf states and the high area became merged in area No. IV, which was then southeast of New England. The minimum temperatures for the month occurred in connection with this area in the Lower Missouri and Upper Mississippi valleys on the 26th and 27th.

No. IV.—At midnight of the 27th the pressures were below the mean in New England and the Lower Lake region, and the Middle and South Atlantic and Gulf states. The pressures increased slowly in the Middle and South Atlantic states and rapidly in New England and the Maritime Provinces during the 28th, and in the two latter districts were slightly above mean at midnight. Easterly winds prevailed in New England and the Maritime Provinces. This pressure continued to increase rapidly in these districts during the 29th, with easterly winds in the former and southwesterly winds in the latter district. Local rains were reported from both districts, followed by clearing weather in the Maritime Provinces during the afternoon, and in New England during the night. The barometer on the morning of the 30th was from 0.3 to 0.4 inch above the mean in New England and the Maritime Provinces, and local rains were reported from the North Carolina coast. The area of high barometer remained nearly stationary southeast of New England during the 30th and 31st, the pressures slowly increasing in the Middle and South Atlantic states, and falling slowly in the St. Lawrence valley and in the Gulf; at midnight of the latter date the barometer was still 0.23 inch above the mean in New England. Rain continued in the Middle and South Atlantic states during the 30th and 31st, clearing in the former district on the 31st. Cautionary signals were ordered on the morning of the 30th from Sandy Hook, N. J., to Macon, N. C. They were lowered from Cape May to Cape Henry at the afternoon report of the 30th; at Atlantic City, Barnegat and Sandy Hook at midnight, and on the morning of the 31st at Kittyhawk, Hatteras and Macon. They were justified by the following maximum velocities: Hatteras, SE. 32 miles; Kittyhawk, E. 36; Chincoteague, E. 25; Delaware Breakwater, NE. 31; Atlantic City, NE. 25 and Sandy Hook, E. 32.

Areas of Low Barometer.—Five such areas have been charted for the month of July, 1881. None of them exhibited special energy.

No. I.—During the 3rd the pressure decreased slowly in the extreme Northwest, and at midnight a depression was central in the Saskatchewan valley: Fort Stevenson, barometer 0.32 inch below the normal. High area No. I, was then central in Tennessee. The temperature had risen in the Northwest, the Lake region, the Ohio valley and New England. Light rains were reported from the Northern Rocky Mountain slope. The depression moved slowly eastward north of the Lakes and at midnight of the 5th was central north of Montreal. Thence pursuing a southeasterly course across New England, it was east of Boston in the morning of the 6th, and had disappeared by the afternoon of the same date. This depression was unaccompanied by precipitation in the Northwest and the Lake region, but caused light rains in New England and the Maritime Provinces on the 5th. Cautionary signals were displayed in advance of this depression at stations on Lakes Michigan and Superior. They were not justified. The maximum temperatures for the month at a majority of the stations in the Middle Atlantic states and southern portion of New England, occurred in connection with this area on the 6th.

No. II—During the 6th the barometer fell decidedly over the Northern Slope and Plateau regions, and in the afternoon an area of low barometer was apparently central in the Saskatchewan valley, although the barometer remained slightly above the mean in all districts in the United States except on the immediate Atlantic coast. Owing to missing reports the track of the depression cannot be accurately charted during the next two days, but the barometer continued to fall in the Northwest, and the depression moved slowly eastward, and at midnight of the 7th was northwest of Fort Garry; Bismarck, barometer 0.45 inch below the normal. On the afternoon of the 8th, it was north of Lake Superior; Duluth, barometer 0.28 inch below the normal. During the 8th, 9th and 10th, it continued its eastward movement north of the Lakes and through the St. Lawrence valley, and disappeared by the afternoon of the 11th.

No. III appeared over the Northern Slope on the 11th and, at the afternoon report, was central near Deadwood; barometer 0.24 inch below the normal. Local rains were reported from stations in the extreme Northwest. Moving slowly eastward the depression was north of Lake Superior on the morning of the 12th; Marquette barometer 0.26 inch below the normal. Heavy rains were reported from the Upper Lake region. It continued to move eastward north of the lakes, causing general rains in the Lake region and occasional thunder-storms in the Mississippi valley; at midnight, it was north of Rockliffe; Kingston barometer 0.16 inch below the normal. Numerous rains were reported from the Middle Atlantic states on the 13th and, at midnight, the depression was west of Chatham, thence it moved eastward off the Atlantic coast. Pressures in the Maritime Provinces remained below the normal until the 18th, when they gradually recovered. No Cautionary signals were ordered for this depression.

No. IV.—On the morning of the 16th a depression made its appearance in the Upper St. Lawrence valley. Its track cannot be accurately charted, but it moved slowly eastward through the Gulf of St. Lawrence during the 16th, 17th and 18th, causing local rains in the Maritime Provinces and New England on all three dates. At midnight of the 19th the weather had cleared and the pressure somewhat recovered in both districts. The barometer, however, remained below the normal in all districts in the United States, excepting the North Pacific. At this report low-area No. IV made its appearance in Ontario, being central north of Rockliffe, barometer 28.58.

Moving southeastward the depression was central north of Montreal, barometer 0.37 inch below the normal. At midnight of the 20th, threatening weather and rain prevailed in New England, the Lower Lake region and the St. Lawrence valley. At midnight of the 21st it was central south of Eastport; barometer 0.37 inch below the normal Continuing to move eastward it was southeast of Nova Scotia on the afternoon of the 22nd. The track of the depression now recurved to the northeastward and it disappeared by midnight of the 23rd, until which time local rains continued in New England and the Maritime Provinces. Cautionary signals were ordered up at midnight of the 20th at Cape May, Delaware Breakwater and Chincoteague. They were lowered on the morning of the 21st, having been justified by maximum velocities of W. 31 miles at Cape May and Delaware Breakwater, and NE. 33 miles at Chincoteague. The latter-signal was ordered late.

No. V.—Appeared in Dakota on the afternoon of the 19th, Deadwood barometer 0.37 inch below the normal. The pressures were below the normal at this report in all districts in the United States, excepting the Northern and Middle Pacific coast regions. Moving southeastward the depression was central near Yankton on the afternoon of the 20th; Yankton barometer 0.53 inch below the normal. At this report the winds, in the Northwest and the Upper Lake region, were under its influence and local rains were reported from the Upper Lake region and the Upper Mississippi valley. During the night of the 20th and during the 21st, the depression moved eastward, causing numerous rains in the Northwest and the Upper Lake region, and at midnight of the 21st, was south of Chicago. On the morning of the 22nd, was south of Toledo, and at the afternoon report was west of Norfolk. Thence it moved southeastward; was south of Cape Hatteras on the morning of the 23rd: disappeared by the afternoon report. This depression caused heavy rains in the Ohio valley on the 21st and in the South Atlantic states during the night of the 22nd and morning of the 23rd. Cautionary signals were ordered at Toledo and Sandusky on the morning of the 21st, and lowered at the afternoon report of the 22nd, having been justified by a maximum velocity of E. 28 miles at Toledo. Signals were also ordered up from Kittyhawk to Chincoteague on the afternoon of the 22nd, and lowered on the afternoon of the 23rd. They were justified by the following maximum velocities: Kittyhawk, SW. 32 miles; Cape Henry, NW. 28, and Chincoteague, NE. 27.

INTERNATIONAL METEOROLOGY.

International charts, Nos. V and VI, accompany the present REVIEW. The former is published for the month of May, 1879, continuing the work for that year, which was delayed after the issue of chart No. V for the month of April, 1879, because of an intermission in the publication of the "Beobachtungen auf dem Nordatlantischen ocean" of the "Deutsche Seewarte." The series of this chart are now complete, from January 1877, up to, and including the present date. Chart No. VI is for August, 1879.

Chart No. V shows the mean pressure, temperature and the prevailing direction of the wind at 7.35 a. m. Washington, or 0 43 p. m. Greenwich, mean time, for the month of May, 1879, over the Northern and at certain isolated stations in the Southern Hemisphere. There are two small areas of low pressure, (29.80) for the present month, one situated just north of the Black Sea and the other covering Iceland, Greenland and the surrounding ocean north of parallel 60°. The former area occupies the precise region over which one of the low areas (29.80) of May, 1877, prevailed, while the latter presents a similar comparison with the position of the area of 29.80 in May, 1878. In addition it should be said, that a very small area, 29.60, (the lowest of the month), for May, 1878, lay off the northwest coast of Ireland. The pressure is generally above 29.90 throughout Asia, except in Toorkistan where probably another area of 29.80 exists; along the Asiatic coast the pressure is generally above 29.80, although the prevailing direction of the winds would seem to indicate the presence of such an area over the ocean south of the Kamtchatka peninsula. The pressure over Hindostan ranges from 29.51 at Patna and Deesa to 29.72 at Chittagong. In the United States the area of lowest pressure, 29.90, prevails over Texas and thence northward over the Eastern Rocky Mountain slope to Dakota. In Europe this area covers a small portion of southern France, northern Italy, Austria and southern Russia. The area of highest pressure (30.30), except at isolated stations, covers the Atlantic from 35° to 45° N., and 25° to 45° W. The area of 30.00 is common to the largest extent of territory, covering as it does the greater part of Europe, Algeria, the West Indies, Canada, Hudson's Bay Territory and in the United States, the Pacific coast and that portion of the country lying east of the Mississippi. The following are the highest readings from isolated stations: Angra and Ponta Delgado, 30.28 (769.0); Funchal, 30.15 (765.7); San Luis Potosi, 30.13 (765.2); Cape Town, 30.11 (764.7); Guadalajara, 30.10 (764.4); Mexico and Fao, 30.08 (763.9); Sfax, 30.06 (763.4); Mauritius, 30.04 (762.9). The extreme monthly range of mean pressure is 0.89 inch, which is 0.29 inch larger than in *May*, 1878, and more than double that for *May*, 1877. The lowest mean temperatures, given in Fahrenheit's scale, were reported from the following stations: Ft. St. Michaels, 26°; York Factory, 31°; Godthaab, 34°; Nikolaievsk on the Amoor, 35°; Stykkisholm and Tromso, 42°; Yeniseisk,